

AMENDMENTS TO SPECIFICATION

Page 1, line 11 to Page 2, line 13:

In ~~the~~ recent years, the communication industry ~~advances~~ has advanced vigorously and various communication products ~~are booming~~ have been very successfully developed and manufactured. ~~Therefore~~ During this time, much attention ~~is~~ has been paid to the design of the antenna of the related communication product. In the various antenna structures, the patch antenna is popular in the market for its characteristics of low profile and lower back radiation. However, the characteristic of the radiation pattern of the prior art patch antenna usually causes ~~that~~ a maximum field is generated above the radiation patch in the direction perpendicular to the antenna (that is, $\theta = 0^\circ$ or having a broadside radiation pattern). And when the angle of $|\theta|$ increases, the radiation intensity of electric field will apparently ~~increases~~ increase. This kind of radiation characteristic for the antenna is unsuitable to the design of the radiation pattern needing omni-directional field above the radiation patch antenna. Although the variation of the field of the antenna radiation pattern will slow down if the size of the ground plane is reduced, it will cost the gain of the antenna. Thus, the application of the prior art patch antenna is limited for the wireless communication product requiring an antenna with wider receiving/transmitting angle.

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The antenna 10 is so designed that the multiple ground planes 11a ~~is~~ are employed for improving the beam-tilt[[]] characteristic caused by the shorted structure so as to promote the antenna gain in the z direction. Although the designed structure of the antenna ~~10~~ 10 can improve the distribution of the radiation pattern, the multiple ground planes 11a have to be composed of three grounding conductive ~~sheet~~ sheets 12, 13, 14 and the complexity of the structure design is increased. Besides, the second grounding conductive sheet 13 must be higher than the radiation patch 11, and the ~~is~~ will affect the appearance of the product and increase the cost.

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The antenna 20 is so designed that cross polarization of the radiation pattern is ~~reduce~~ reduced so as to increase the purity of the linear polarization of the antenna. However, this designed structure will not apparently improve the gain of the antenna. In addition, as shown in Fig. 2, the U-shaped ground plane 22 has to have a planar ground plane 22a and two perpendicular ground planes 22b. In other ~~word~~ words, the plane 22 is composed of three metal pieces so as to increase the complexity of the structure of the antenna 20.

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Fig. 1 is a perspective diagram of a prior art shorted[[]] ~~microstip~~ microstrip antenna with multiple ground planes;

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Please refer to Fig. 3(a) and 3(b). Fig. 3(a) is a perspective diagram of a radiation device 30 with a L-shaped ground plane 35 according to a first embodiment of the present invention. Fig. 3(b) is a side view of the radiation device 30. The radiation device 30 comprises a radiation patch 31, a feeding-in device 32, and a L-shaped ground plane 35. The radiation device 30 transmits the energy through the feeding-in device 32, and excites the radiation patch 31 to generate radiation. The L-shaped ground plane 35 si composed of a first ground plane 33 and a second ground plane 34. The first ground plane 34 is almost perpendicular to the first ground plane 33. The radiation metal piece (radiation patch) 31 is fixed on the first ground plane 33 by using a non-conductive post (not shown), and the feeding-in device 32 is used for connecting the radiation patch 31 and the L-shaped ground plane 35, and for exciting the radiation patch 31 to transmit signals. On the left side of the first ground plane 33 (namely, the x direction), the second ground plane 34, which is spaced-from and not in contact with the radiation patch 31, is extended upward from the surface of the first ground plane 33 where the radiation patch 31 is installed so as to form a ground plane structure to ~~be as~~ form a L-shaped ground plane 35.

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Please refer to FIG. 6. Fig. 6 is a perspective diagram of a radiation device 60 according to a second embodiment of the present invention. The difference between the radiation device 60 and the radiation device 30 is that the radiation device 60 has a different L-shaped ground plane 61. In the radiation device 60, the second ground plane 61 is installed on the right side (+x direction) of the first ground plane 33 and is extended upward by the height of 6 mm from the surface of the first ground plane 33 where the radiation patch is installed.